What is claimed is:

1. A single sideband (SSB) mixer, comprising:

a first mixer and a second mixer, wherein the first and second mixers multiply an input IF (intermediate frequency) signal by a local IF signal having the same frequency of the input IF signal;

a band-pass filter which passes upper sideband signal output from the first mixer;

a third mixer which multiplies the upper sideband signals output from the band-pass filter by a LO (local oscillating) signal;

a fourth mixer which multiplies the signals output from the second mixer by the

LO signal; and

a subtraction device that subtracts output signals of the third mixer from output signals of the fourth mixer.

- 2. The SSB mixer of claim 1, further comprising a variable gain amplifier, operatively connected between the second and fourth mixers, for adjusting the gain and phase of signals output from the second mixer.
 - 3. The SSB mixer of claim 1, further comprising means for generating the local IF signal and the LO signal.

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- 4. The SSB mixer of claim 1, wherein the output of the subtraction device comprises a signal having the same frequency as the LO signal.
 - 5. A SSB (single sideband) mixer, comprising:

a first mixer for multiplying a first input IF (intermediate frequency) signal by a local IF signal having the same frequency of the input IF signal;

a second mixer for multiplying the local IF signal by a second input IF signal, wherein the second IF input signal is the same as the first input IF signal but opposite in phase;

a band-pass filter which passes upper sideband signals output from the first mixer; a third mixer which multiplies signals output from the band-pass filter by a LO (local oscillating) signal;

a fourth mixer which multiplies signals output from the second mixer by the LO signal; and

an adding device which adds signals output from the third and fourth mixers.

6. The SSB mixer of claim 5, further comprising a variable gain amplifier, operatively connected between the second and fourth mixers, for adjusting the gain and phase of the signals output from the second mixer.

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- 7. The SSB mixer of claim 5, further comprising means for generating the local IF signal and the LO signal.
- 8. The SSB mixer of claim 5, wherein the output of the adding device comprises a signal having the same frequency as the LO signal.
 - 9. A SSB (single sideband) mixer, comprising:

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a first mixer which multiplies an input IF (intermediate frequency) signal by a local IF signal having the same frequency as the input IF signal;

a low pass filter which passes a base band signal output from the first mixer; and a second mixer which multiplies the base band signal by a LO (local oscillating) signal.

- 10. The SSB mixer of claim 9, further comprising means for generating the local IF signal and the LO signal.
 - 11. The SSB mixer of claim 9, wherein the second mixer outputs a signal having the same frequency as the LO signal.

- 12. A method of extracting a single sideband (SSB) signal, comprising the steps of:
- (a) multiplying an input IF (intermediate frequency) signal by a local IF signal having the same frequency of the input IF signal to generate an upper sideband and lower sideband of frequencies, the upper sideband comprising a signal equal in frequency to the sum of the frequencies of the input IF signal and the local IF signal, and the lower side band comprising a signal equal in frequency to the difference between the frequencies of the input IF signal and the local IF signal;
- (b) multiplying said upper sideband by a LO (local oscillating) signal to generate first output signals;
 - (c) multiplying said lower sidebands by the LO signal to generate second output signals; and
 - (d) subtracting the first output signals from the second output signals to obtain a single frequency signal.

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- 13. The method of claim 12, further comprising the step of filtering the signals obtained in step (a) to provide said upper sideband used in step (b).
- 14. The method of claim 12, wherein said single frequency signal obtained instep (d) comprises the LO signal frequency.

- 15. A method of extracting a single sideband (SSB) signal, comprising the steps of:
- (a) multiplying an input IF (intermediate frequency) signal by a local IF signal having the same frequency of the input IF signal to generate a first upper sideband and a first lower sideband of frequencies, the first upper sideband comprising a signal equal in frequency to the sum of the frequencies of the input IF signal and the local IF signal, and the first lower sideband comprising a signal equal in frequency to the difference between the frequencies of the input IF signal and the local IF signal;

- (b) filtering the signals obtained in step (a) to output only said first uppersideband;
 - (c) inverting the input IF signal and multiplying the inverted input IF signal by the local IF signal to generate a second upper sideband and a second lower sideband of frequencies, the second upper sideband comprising a signal equal in frequency to the sum of the frequencies of the inverted input IF signal and the local IF signal, and the second lower side band comprising a signal equal in frequency to the difference between the frequencies of the inverted input IF signal and the local IF signal;
 - (d) multiplying said first upper sideband obtained in step (b) by a LO (local oscillating) signal;
- (e) multiplying said second upper sideband and said second lower sideband obtained in step (c) by the LO signal; and

- (f) adding signals obtained in steps (d) and (e) and outputting a single frequency signal.
- The method of claim 15, wherein said single frequency signal obtained in
 step (f) comprises the LO signal frequency.
 - 17. A method of extracting a single sideband (SSB) signal, comprising the steps of:
 - (a) multiplying an input IF (intermediate frequency signal) signal by a local IF signal having the same frequency as the input IF signal to generate a plurality of signals;

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- (b) extracting a base-band signal from the plurality of signals generated in step
 (a); and
- (c) multiplying the base-band signal by a LO (local oscillating) signal and outputting a single frequency signal.

18. The method of claim 17, wherein the single frequency signal obtained in step (c) comprises the LO signal frequency.